REQUIREMENTS FOR THE DESIGN AND CONSTRUCTION OF UNDERGROUND UTILITY INSTALLATIONS WITHIN THE STATE HIGHWAY RIGHT-OF-WAY

NEW YORK STATE DEPARTMENT OF TRANSPORTATION
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INTRODUCTION

This publication is to be used in conjunction with Part 131 and 126 of New York State Department of Transportation Rules and Regulations, NYCRR Title 17.

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REQUIREMENTS FOR THE DESIGN
&
CONSTRUCTION OF UNDERGROUND UTILITY INSTALLATIONS
WITHIN THE STATE HIGHWAY RIGHT-OF-WAY

1.00 GENERAL CONDITIONS

These conditions and regulations apply to Highway Work Permits authorizing work within the State highway right-of-way for Water Mains, Gas Mains, Sewer Lines, Telephone, Telegraph and Electric and Miscellaneous Structures. These conditions, and any special conditions which are added to the Work Permit on the method of performing work, are enforceable by the Department of Transportation.

1.01 Time

Work under the permit shall be commenced within thirty (30) days from date of permit issuance, unless extension of this period is approved by the Regional Traffic Engineer.

2.00 GENERAL REQUIREMENTS (UNDERGROUND)

2.01 All underground crossings shall be placed beneath the pavement and shoulder areas without disturbance to the pavements unless otherwise approved by the Regional Traffic Engineer. Such installation shall be by jacking, boring, or drilling, in conformance with the specification section. Water jetting will not be permitted. No open cuts will be allowed unless no other method is feasible. The increased cost of alternate methods shall not be considered as justification for open cuts. All current requirements of Chapter XVII, Occupational Safety & Health Administration, Department of Labor, Part 1926, Safety & Health Regulations for Construction, New York State Department of Labor Industrial Code Rule 23, Protection of Persons Employed in Construction and Demolition Work, & Industrial Code Rule 53, Construction Excavation and Demolition Operations at or near underground facilities, and Part 131 of New York State Dept. of Transportation Rules & Regulations, shall apply. Temporary soil erosion and water pollution controls shall be used as required.

2.02 Plans for underground installations shall be submitted to and meet the approval of the Regional Traffic Engineer prior to the permit issuance. A maintenance and protection of traffic plan may also be required.

2.03 Plans shall be drawn to scale and show the following: (See Drawings 1-6). Sketches may be allowed if approved by the Regional Traffic Engineer.

2.03.01 Plan view of proposed underground installation in relation

to other highway facilities that may be affected including but not limited to underground traffic signal equipment, pavement, culverts, bridges, ditches, underdrain, anchors, footings, etc. The location of all excavations, jacking pits, etc. must be indicated on the plans.

2.03.02 Location of underground installation (in feet) from nearest highway mile point, reference marker, or survey baseline station.

2.03.03 State highway number of area for proposed occupancy.

2.03.04 Profile of ground at centerline of pipe, showing relationship of pipe and casing to ground level, pavement and other utilities (See Dwg. No. 2). For longitudinal occupations, the profile of adjacent pavements shall be shown. (See Dwg.3).

2.03.05 The limits of the highway right-of-way and property lines, where pertinent, shall be clearly indicated with dimensions from centerline.

2.03.06 The angle of crossings in relation to centerline of pavement. (See Section 2.07).

2.03.07 "Pipe Crossing Data Sheet" completed and put on plan. (See Dwg. No. 4)

2.03.08 Appropriate specification included (See Specifications-Section 4).

2.04 Method of Installation

2.04.01 The plan must be specific. It shall describe in detail size, length, depth, material, provisions for grouting, method of construction, etc.

2.04.02 Specify the type of equipment and construction procedures to be used. This is to include operations involving ground water control.

2.04.03 Size and material of casing pipe.

2.04.04 Size and material of carrier pipe.

2.05 Location and dimensions of jacking, boring or tunneling pits shall be shown, with details of their sheeting, shoring and provisions for surface and ground water controls. (See Dwg. No. 5) Pits shall be located as far as practical from the pavement, but in no event shall they be closer than 10 feet from the edge of shoulder.

2.06 Plans and specifications of major highway work permits shall bear the seal of a New York State Licensed Professional Engineer, when required by the Regional Traffic Engineer.

2.07 Underground installations shall be located, where practical, to cross the pavement at approximate right angles thereto, but preferable at not less than 45 degrees.

2.08 Underground installations shall not be placed inside a culvert, under or on a bridge, except in special cases, and then by special design as approved by the Regional Traffic Engineer.

2.09 Any replacement or modification of a carrier pipe shall be considered a new installation, subject to the requirements of these specifications.

2.10 Where laws or orders of a regulating agency prescribe a higher degree of protection than specified herein, then the higher degree so prescribed shall be deemed a part of these specifications.

2.11 Underground installations shall be suitably insulated from underground conduits carrying electric wires on State property.

2.12 When required by the Regional Traffic Engineer soil boring or other soil investigations shall be made to determine the nature of the underlying material for underground installations.

2.12.01 Soil borings shall be in accordance with Section 648 "Subsurface Explorations" of the New York State Department of Transportation Specifications.

2.12.02 Soil boring logs shall be accompanied with a plan drawn to scale showing location of borings in relation to the pavement and the proposed pipe location, the elevation of ground surface at each boring and ground water elevation. Material changes will also be noted such as sand, gravel, rock and boulders. (See Dwg. No. 6)

2.13 Abandoned Underground Installations Within the State Right-of-Way. The owner of the installation shall notify, in writing, the Regional Traffic Engineer of the intention to abandon. For large diameter casings, the owner may be required to remove the facilities or completely fill by cement grout, compacted sand, or other methods.

2.14 Inspection and testing will be as determined and supervised by the Department of Transportation. All costs incurred by the State necessary for these functions will be paid for by the applicant.

2.15 All operations shall be conducted so as not to interfere with, interrupt, or endanger the operation of traffic, nor damage, destroy, or endanger the integrity of State facilities. Operations will be subject to State inspection at all times.

2.16 Blasting will not be permitted under or near highways and facilities unless approved by the Regional Traffic Engineer. The contractor shall submit his proposed blasting patterns and procedures for review prior to blasting. A meeting at the site shall be required prior to commencement of actual blasting operations.

3.00 ADDITIONAL REQUIREMENTS

3.01 Installations that cross and/or are under pavement and shoulder area.

3.01.01 Underground installation crossing roadways involving pipelines and utilities shall generally be encased in a larger pipe or conduit. Exceptions to this requirement shall be under the conditions stated in section 4.02.01, 4.02.02, and 4.02.03.

3.01.02 Casing pipe under pavement and/or across highway pavements shall be not less than 5 feet from the top of existing or proposed pavement at any point unless approved by the Regional Traffic Engineer.

3.01.03 The casing pipes shall be laid across the entire width of the roadway, and shall extend 10' beyond the edge of existing, or proposed, shoulder.

3.01.04 Casing pipe shall be so constructed as to prevent leakage of any substance from the casing throughout its length.

3.02. Boring, Jacking, tunneling.

3.02.01 Close observation shall be maintained to detect any settlement or displacement of highway embankment, pavement, shoulders or other facilities. Repair or replacement shall be at permittee's expense.

3.02.02 Grouting operations may be required if loss of ground is a possibility or voids are caused around casing. When grouting is required it shall consist of 1 part cement to 2 parts sand by volume, or an approved equal.

3.02.03 Chemical soil stabilization may be required by the Regional Traffic Engineer as design or field conditions dictate.

3.02.04 If an obstruction is encountered during installation to stop the forward action of the pipe, and it becomes evident that it is impossible to advance the pipe, operations will cease and the pipe shall be filled, plugged on both ends, and abandoned in place as noted in section 2.13.

3.02.05 Bored or jacked installations shall have a bored hole essentially the same as the outside diameter of the pipe. If voids should develop or if the bored hole diameter is greater than the outside diameter of the pipe, grouting or other methods approved by the Regional Traffic Engineer shall be employed to fill such voids.

3.02.06 When dewatering is required, the proposed method of dewatering must be submitted to the Regional Traffic Engineer for approval.

3.02.07 On all boring, drilling or jacking operations, the applicant must provide proof that the machine operator has experience and is competent in the operation of that machine.

3.03 Excavation of pavement, shoulder and sidewalk areas.

3.03.01 Installation by open excavation will be permitted only with the approval of the Regional Traffic Engineer.

3.03.02 Pavement and shoulder removal shall be done in a manner that provides for proper restoration of the replacement sections. Generally, straight, vertical cuts of the pavement and shoulder will be required (See Dwg. no. 7). Pavement that becomes undermined shall be cut back and removed. Alternative repair methods may be used if prior approval is granted by the Regional Traffic Engineer.

An evaluation may be required on the need for sheeting, or other special measures, for support of the highway pavement.

3.03.03 The subbase course shall be a minimum of 12 inches thick unless otherwise approved. The material shall meet the requirements for subbase course Item 304 of the NYS Dept. of Transportation Specifications.

3.03.04 Backfill shall be with granular material meeting the specification requirements for select granular fill in the New York State Department of Transportation Specifications. Chemical grout, mortar concrete, k-crete or other self-densifying materials may be substituted as approved by the Regional Traffic Engineer.

3.03.05 The backfill material shall be placed in 6" layers and compacted according to the requirements for backfilling as described in Section 203, New York State Department of Transportation Specifications.

3.03.06 Pavement. The replaced pavement shall be similar to the existing pavement in composition and texture. The selection of the material type and composition shall be subject to the approval of the Regional Traffic Engineer. The limit of pavement replacement shall be such that the replaced pavement is supported by thoroughly compacted subbase material and the pavement is restored to the proper grade, cross-slope and smoothness.

When bituminous concrete mixtures are required for the pavement replacement, the layers shall consist of one or a combination of mixture types contained in Table 401-1, Composition of Bituminous Plant Mixtures in Section 401 of the New York State Department of Transportion Specification. The mixture shall be placed at the proper temperature, without segregation, and compacted thoroughly.

When portland cement mixtures are required for pavement replacement, the mixtures shall consist of either Class C or Class F as contained in Table 501-3. Concrete Mixtures in Section 501 of the New York State Department of Transportation Specifications. Class F is a high early strength mixture and should be used when early opening to traffic is desired.

The concrete mixtures shall be placed without segregation, then consolidated, finished to the proper elevation, and textured. Curing the concrete pavement shall be in accordance with one of the methods permitted in Section 502 pertaining to curing.

3.03.07 Shoulders. Pavement shoulders, curbs, gutters and other incidental features shall be replaced in kind unless otherwise approved by the Regional Traffic Engineer.

3.03.08 No pavement cuts are to be left unfilled overnight except in extraordinary cases. With prior approval from the Regional Traffic Engineer, steel cover plates may be used. Recessing of these plates may be required.

3.03.09 Temporary pavements and shoulders shall be placed as soon as a cross-over installation is completed. If permanent pavement placement is to be delayed, temporary pavements

shall be maintained flush with the adjacent pavement surfaces until the pavement is placed.

3.03.10 Only under extraordinary conditions will longitudinal placement of pipes under existing pavement be allowed. In such circumstances a casing pipe or extra thickness carrier pipe will be required. See Section 131.17 of Part 131 NYCRR Title 17.

3.03.11 Pipelines laid longitudinally within the highway right-of-way, shall be buried not less than 3 feet from ground surface to top of pipe. Required materials and backfill methods shall be as stated in 3.03.01-3.03.07 above.

3.03.12 Sidewalk replacement shall be performed in a neat and workmanship like manner, in accordance with sections 3.03.01 through 3.03.06. Sidewalk replacement materials shall be of equivalent type and thickness. Handicapped person ramps may be required at intersections.

3.04 Open Excavation outside of pavement and shoulder areas.

3.04.01 Backfill shall consist of suitable excavated or borrow material.

3.04.02 Compaction shall be as necessary to prevent subsidence of the backfill. Additional material may be required to maintain the backfill level with the surrounding ground.

4.00 SPECIFICATIONS

4.01 Carrier Pipe

Pipelines carrying oil, liquified petroleum gas, natural or manufactured gas, and other flammable products shall conform to the requirements of all current industry standards, as well as all applicable State and Federal Regulations, codes and rules, including but not limted to: National Electrical Safety Code; Title 16 NYCRR Chapters II and III; USASI Publications B31.1, B31.4, B31.8; 49 CFR of USDOT Rules and Regulations.

4.01.01 All applicable requirements for carrier pipe under pavements shall apply for a minimum distance of 50 feet (Measured at right angles) from centerline, 25 feet beyond the ends of casing, or to the ROW, whichever is greater.

4.01.02 Pipelines carrying non-flammable substances shall be of accepted material and construction as approved by the Regional Traffic Engineer. Joints for carrier line pipe operating under pressure shall be mechanical or welded type.

4.01.03 Carrying pipes shall be laid with sufficient slack so that they are not in tension.

4.02 Casing Pipe

4.02.01 Pipes shall generally be encased in sleeves or large pipes. Small diameter services (2" I.D. or smaller) may be placed unencased if approved by NYSDOT.

4.02.02 For non-pressure sewer or drainage crossings, the encasement may be omitted if the pipe strength is capable of withstanding highway loadings.

4.02.03 Unencased crossover carrier pipes are generally not allowed, however they may be permitted by the Regional Traffic Engineer on a case by case basis as allowed in part 131 of the Department's Rules and Regulations. Such crossover pipes shall be made stronger and more durable, so as to minimize the need for repair or replacement. Such measures shall include:

a) Increase pipe thickness for the length of the crossing plus additional distance as required.
b) Adequate wrapping to protect against corrosion.
c) Cathodic protection
d) Suitably designed protective jacket (usually reinforced)
e) Other methods as approved by the Regional Traffic Engineer.

Such measures shall be in accordance with industry standards and shall meet the codes, rules, etc. of all applicable regulating agencies.

4.02.04 Casing pipe and joints shall be of leakproof construction, designed for the earth and/or other pressures present, plus a H-20 live loading with 50% added for impact.

4.02.05 Steel pipe shall have a minimum yield strength of 35,000 psi.

Casing pipe shall meet ASTM Specifications A-139, Grade B or equal.

4.02.06 When casing is installed without benefit of a protective coating, and is not cathodically protected, the wall thickness shall be increased to the next nearest standard size, which is a minimum of 1/16 inches greater than the thickness except for diameters under 12-3/4 inches.

4.02.07 Cast iron pipe may be allowed as casing for open trench installations only. Cast iron pipe shall conform to the current ANSI A 21. The pipe shall be of the mechanical joint type or plain end type with

compression type couplings. The strength of cast iron pipe to sustain external loads shall be computed in accordance with the current ANSI A 21.1, "Thickness Design of Cast Iron Pipe".

4.02.08 Corrugated metal pipe may be allowed for casings. It shall conform to section 707 of the NYS Department of Transportation Specifications.

4.02.09 Corrugated structural steel plate pipe and tunnel liner plates may be allowed for casing. They shall conform with section 664 of the New York State Department of Transportation Specifications.

4.02.10 Reinforced concrete pipe may be allowed for a casing. It shall conform to the current ASTM Specifications C-76, Class V, Wall C. It shall be used only with the approval of the Regional Traffic Engineer.

4.02.11 The inside diameter of the casing pipe shall be such as to allow the carrier pipe to be removed subsequently without disturbing the casing or the roadbed. For steel pipe casings, the inside diameter of the casing pipe shall be at least 2 inches greater than the largest outside diameter of the carrier pipe joints or couplings, for carrier pipe less than 6 inches in diameter; and at least 4 inches greater for carrier pipe 6 inches and over in diameter.

For flexible casing pipe, a minimum vertical deflection of the casing pipe for 3 percent of its diameter, plus 1/2 inch, shall be provided so that no loads from the roadbed, traffic, or casing pipe itself are transmitted to the carrier pipe. When insulators are used on the carrier pipe, the inside diameter of the flexible casing pipe shall be at least 2 inches greater that the outside diameter of the carrier pipe for pipe less than 8 inches in diameter; at least 3¼ inches greater for pipe 8 inches to 16 inches, inclusive, in diameter; and at least 4 1/2 inches greater for pipe 18 inches and over in diameter.

4.02.12 When steel casing pipe is used, the joints shall be welded completely around the circumference of the pipe.

4.02.13 Casing pipe under pavements shall extend a minimum of 10 feet beyond the edge of shoulder. For pipes carrying flammable substances, the casing shall extend to the ROW line, or 25' from the edge of shoulder, whichever is greater. (See Dwg. No. 2). Additional casing lengths maybe required by the Regional Traffic Engineer.

4.03 Protection at ends of casing

4.03.01 Casings for carriers of flammable substances shall be suitably sealed to the outside of the carrier pipe.

4.03.02 Casings for carriers of non-flammable substances shall have both ends of the casing blocked up in such a way as to prevent the entrance of foreign material, but allowing leakage to pass in the event of a carrier break.

4.03.03 Where ends of casing are at or above ground surface and above high water level, they may be left open, provided drainage is afforded in such a manner that leakage will be conducted away from the roadway and structures.

4.04 Vents

4.04.01 Sealed casings for flammable substances shall be properly vented. Vent pipes shall be of sufficient diameter, but in no case less than 2 inches in diameter, and shall be attached near each end of the casing.

4.04.02 Vent pipes shall extend not less than 4 feet above the ground surface. Top of vent pipe shall have a down-turned elbow, properly screened, or a relief valve. Vents in locations subject to high water shall be extended above the maximum elevation of high water and shall be supported and protected in a manner approved by the Regional Traffic Engineer.

4.04.03 Vent pipes shall be at least 4 feet (vertically) from aerial electric wires.

4.04.04 The only exception to vent pipes is when the pipeline location is such that it would be impossible to place them.

4.05 Signs

4.05.01 All pipelines (except in urban areas) shall be prominently marked at right-of-ways (on both sides of the pavement for undercrossings) by durable, weather-proof signs located over the centerline of the pipe. Signs shall show the following:

a) Name & address of owner.

b) Contents of pipe.
c) Pressure in pipe.
d) Depth below grade at point of sign
e) Emergency telephone in event of pipe rupture.

4.06 Shut off Values

Emergency shut off valves shall be installed as required by New York State Public Service Commission Regulations, and Federal DOT Regulations (49 CFR).

4.07 Jacking

This method shall be in accordance with the current New York State Department of Transportation Specifications Section 650.

4.08 Drilling

This method shall employ the use of an oil field type rock roller bit or a plate bit made up of individual roller cutter units. A high density slurry (oil field drilling mud) may be injected through a small supply line to the head to act as a cutter lubricant. The point of injection of the slurry shall be at the rear of the cutter units to prevent any jetting action ahead of the pipe. The drilling machine shall run on a set of steel rails and shall be advanced by a set of hydraulic jacks. The method is the same whether earth or rock is being drilled. Methods of a similar nature shall be submitted to the Regional Traffic Engineer for approval.

4.09 Boring

This method shall consist of pushing the pipe with a boring auger rotating within or ahead of the pipe to remove the spoils. The excavation by the cutting head shall not exceed the outside diameter of the pipe by more than one-half inch. The face of the cutting head shall not exceed the outside diameter of the pipe by more than one-half inch. The face of the cutting head shall be arranged to provide reasonable obstruction to the free flow of soft or loose material.

The use of jetting method to install casing or remove spoil is prohibited.

The use of water to facilitate progression of the casing or spoil removal is subject to approval of the Regional Traffic Engineer.

Plans and descriptions of the method and layout to be used shall be submitted to the Regional Traffic Engineer for

approval and no work shall proceed until such approval is obtained.

Any method which employs simultaneous boring and jacking or drilling and jacking for pipes over 4 inches in diameter which does not have the above approved arrangement WILL NOT BE PERMITTED. For pipes 4 inches and less in diameter, augering or boring without this arrangement may be considered for use only as approved by the Regional Traffic Engineer.

4.10 Tunneling

This method shall be in accordance with the current New York State Department of Transportation Specifications Section 664 "Tunnel Liner Plate", with the following additions:

1) Excavation shall not be advanced ahead of the previously installed liner plates any more than is necessary for the installation of the succeeding liner plates.

2) Tunnel Shields may be required (See Tunnel Shields)

4.10.01 Tunnel Shields

Pipes installed by tunneling shall be installed with the use of a full or partial tunneling shield or poling plates, as required by the Regional Traffic Engineer.

4.10.02 Full tunnel shield

The shield shall be of steel construction, designed to support anticipated loading as specified in casing pipe. The advancing face shall be provided with a hood extending not more than 20 inches beyond the face and extending around no less than the upper two-thirds of the circumference. It shall be of sufficient length to permit the installation of at least one complete ring of liner plates within the shield before it is advanced for the installation of the next ring of liner plates. It shall conform to and not exceed the outside dimensions of the pipe being installed by more than one inch at any point on the periphery, unless otherwise approved by the Regional Traffic Engineer.

It shall be adequately braced and provided with necessary appurtenances for completely bulkheading the face. Excavation shall not be advanced beyond the edge of the hood, except in rock.

For jacking reinforced concrete pipe, the shield may be fabricated as a special section of reinforced concrete pipe with the steel cutting edge, breasting attachments,

etc. cast into the pipe. The wall thickness and reinforcing shall be designed for the jacking stresses.

Detail plans sufficient to determine the adequacy of the shield, accompanied with design calculations, shall be submitted to the Regional Traffic Engineer for approval and no work shall proceed until such approval is obtained.

4.10.03 Partial tunnel shield

The shield shall be of steel construction, designed to support anticipated loading as specified in casing pipe. The advancing face shall be provided with a hood, extending not more than 20 inches beyond the face and extending around no less than the upper one-third of the circumference. It shall conform to and not exceed the outside dimensions of the pipe being installed by more than one inch at any point on the periphery unless otherwise approved by the Regional Traffic Engineer. Excavation shall not be advanced beyond the hood, except in rock.

For jacking smooth steel pipe, the shield may be welded to the casing pipe. The wall thickness shall be designed for the jacking stresses.

Detail plans sufficient to determine the adequacy of the shield accompanied with design calculations, shall be submitted to the Regional Traffic Engineer for approval and no work shall proceed until such approval is obtained.

4.10.04 Poling Plates

Poling Plates shall be of steel construction designed to support the ground outside the bounds of the tunnel through beam action. The beam action shall be capable of extending not more than 20 inches beyond the face and extending around no less than the upper one-thrid of the circumference. The Poling Plates shall conform to the configuration of the pipe being installed.

Detail plans sufficient to determine the adequacy of the poling plates, accompanied with design calculations, shall be submitted to the Regional Traffic Engineer for approval and no work shall proceed until such approval is obtained.

4.11 Sheeting

Sheeting shall be in accordance with New York State Department of Transportation Specifications Section 552 except as noted in 4.11.02 of these requirements. Design by NYS licensed professional Engineer may be required.

4.11.01 Plans submitted with the permit application shall, when necessary, specify one or more of the following:

a) Permanent Timber Sheet Piling.
b) Permanent Steel Sheet Piling.
c) Temporary Timber Sheet Piling.
d) Temporary Steel Sheet Piling.
e) Safe Operation Sheet Piling.

4.11.02 Trenching and/or digging boxes will not be permitted unless approved by the Regional Traffic Engineer. Specifications will be submitted for approval.

4.12 Excavation and embankment

Excavation and embankment shall be in accordance with current New York State Department of Transportation Specifications Section 203.

4.13 Trench, culvert, & structure excavation

Trench, culvert and structure excavation shall be in accordance with New York State Department of Transportation Specifications, Section 206.

4.14 Backfill

Backfill shall be in accordance with New York State Department of Transportation Specifications Section 203 Select Granular Fill & Select Structure Fill.

4.15 Backfill, chemically stabilized

Submit specification to Regional Traffic Engineer for approval.

4.16 Subbase

Subbase shall conform to section 304 of the New York State Department of Transportation Specifications. Stockpiling will not be required.

4.17 Chemical stabilization for tunneling & boring

Submit specification to Regional Traffic Engineer.

4.18 Concrete pavement

Concrete pavement shall be in accordance with current New York State Department of Transportation Specification Section 500.

4.19 Asphalt Concrete Pavement

Asphalt concrete pavement shall be in accordance with current New York State Department of Transportation Specifications Section 400.

5.00 MAINTENANCE AND PROTECTION OF TRAFFIC

5.01 Traffic is to be maintained at all times during the progress of this work and adequate signs, barricades and lights shall be provided in accordance with the provisions of Sub-chapter H of the NYS Department of Transportation's Manual of Uniform Traffic Control Devices. A maintenance and protection of traffic (M&P) plan may be required. No lanes shall be closed without prior approval. An on site representative shall be designated and be responsible for implementation of the M&P plan.

5.02 The applicant shall erect and maintain suitable barricades around all trenches while work is in progress for the protection of the public, and they shall be suitably lighted by yellow lights at night. The work shall be carried on in such manner that not more than 100 feet of trench in earth remains open at end of day's work.

5.03 No pavement cuts are to be left unfilled over night, except in emergencies, and in such cases, adequate precautions must be exercised to protect traffic. Prior approval must be obtained to use steel plating.

5.04 No construction materials or equipment shall be left on the shoulders or pavement after working hours, nor shall any construction equipment or material be placed in any manner or location that will obstruct highway or railroad warning signs.

5.05 All open trench in the highway right-of-way shall be barricaded. There shall be conspicuously displayed bright red flags no less than 24" x 24" attached to such barricades and illuminated at night with flashing yellow lights. If in the judgment of the Regional Traffic Engineer that flagmen are necessary, they shall be employed by the permittee and on duty at all times during the progress of the work so as to direct traffic and maintain yellow lights, etc.

5.06 Soft shoulder signs of adequate size, not less than 24" square, shall be erected and maintained on all backfill trenches within the shoulder area until the backfill is thoroughly settled. These signs shall be located at the beginning of each section of work at intersections and at a distance not greater than 1000 feet apart.

5.07 During winter conditions the utility must perform its work so that the highway is free of obstructions which would interfere with snow removal and ice control.

No drums, cones, barricades and other traffic control equipment shall remain in a location where they'll interfere with or be disturbed by a snow plowing operation. The work must be

scheduled to afford the safe removal of such devices when necessary.

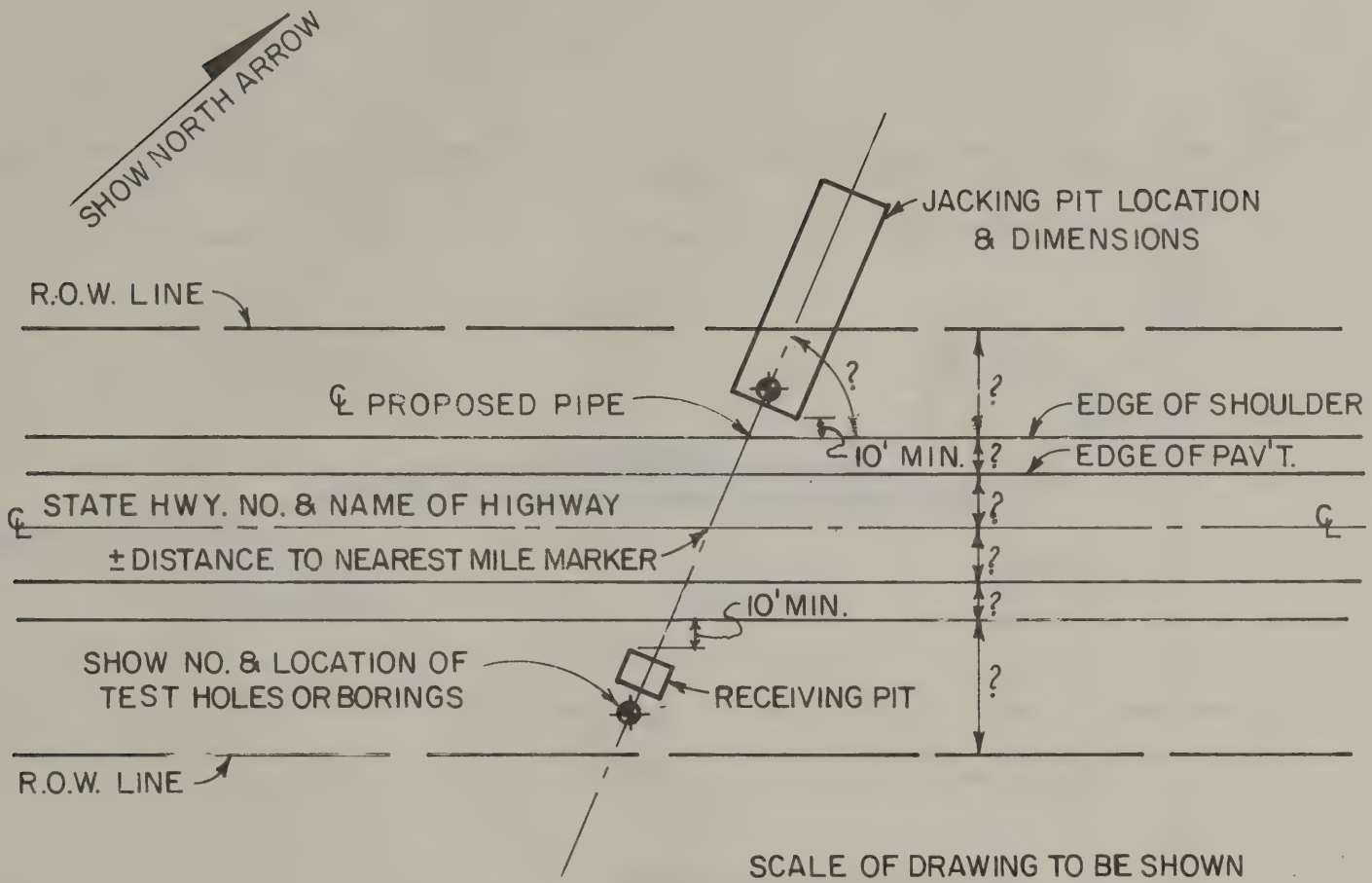
Drainage frames, grates and covers shall not be adjusted in a travel lane unless the final pavement course is placed prior to the onset of snow and ice weather. Steel plates, etc. shall not protrude above adjacent pavement. If any of these protrusions exist in a non-travel lane prior to a snow and ice condition, then temporary asphalt ramps must be placed so that for every one inch of rise, there is a six foot run of ramp.

5.08 During the winter months care must be taken to obtain proper compaction of all earth work. The contractor will be required to return to make repair or replacement should pavement settlement result.

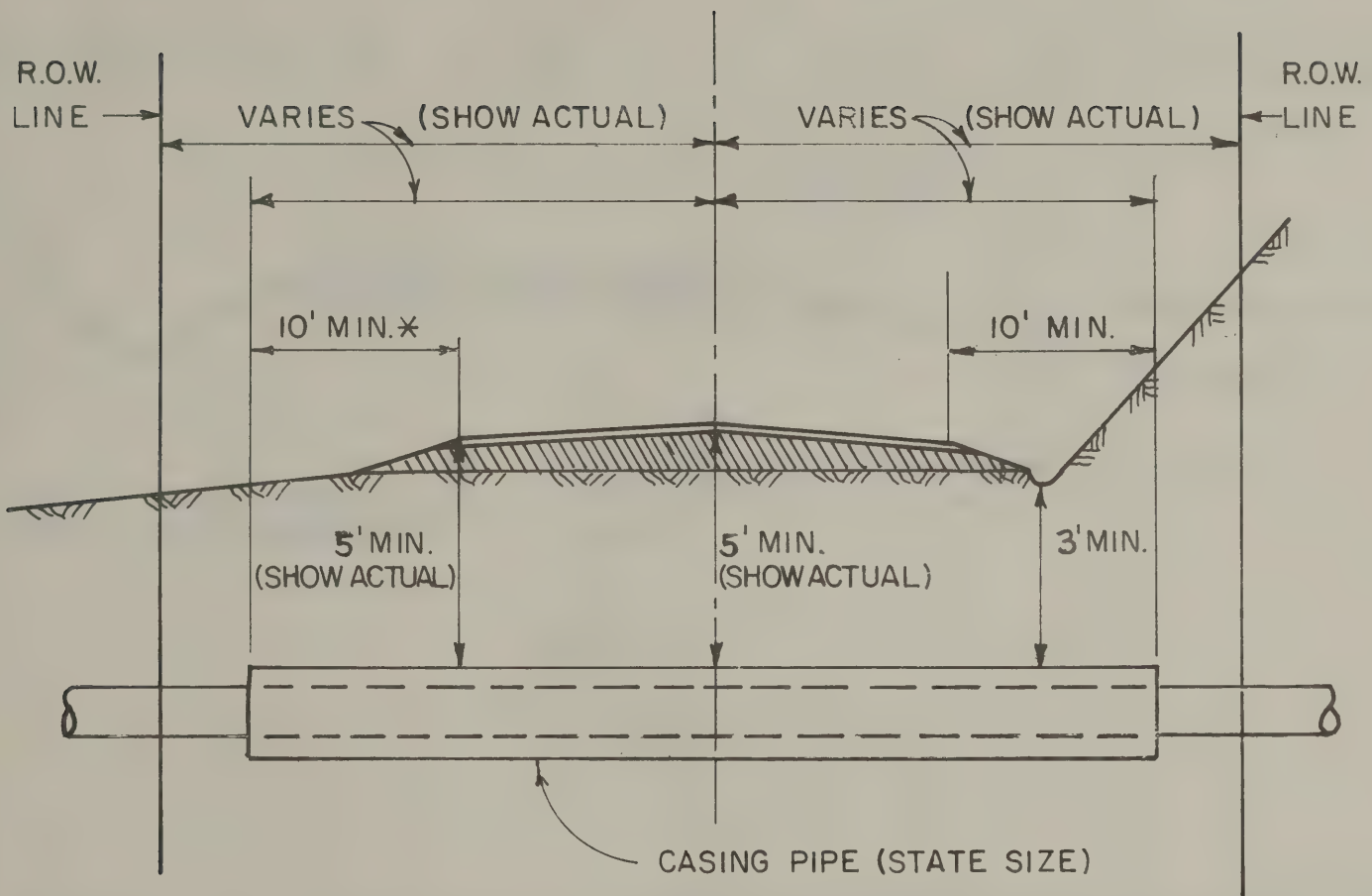
5.09 The permittee shall keep the traveled way free of foreign objects such as rocks, timber and other items that may fall from transporting vehicles. Spillage of material carried by or dropped from the under-carriage of any carrying vehicle resulting from the permittee's hauling operations along or across any public traveled way shall be removed immediately from such traveled way, both within and outside of the work limits, shall be kept free of such spillage by the permittee.

DWG. 1

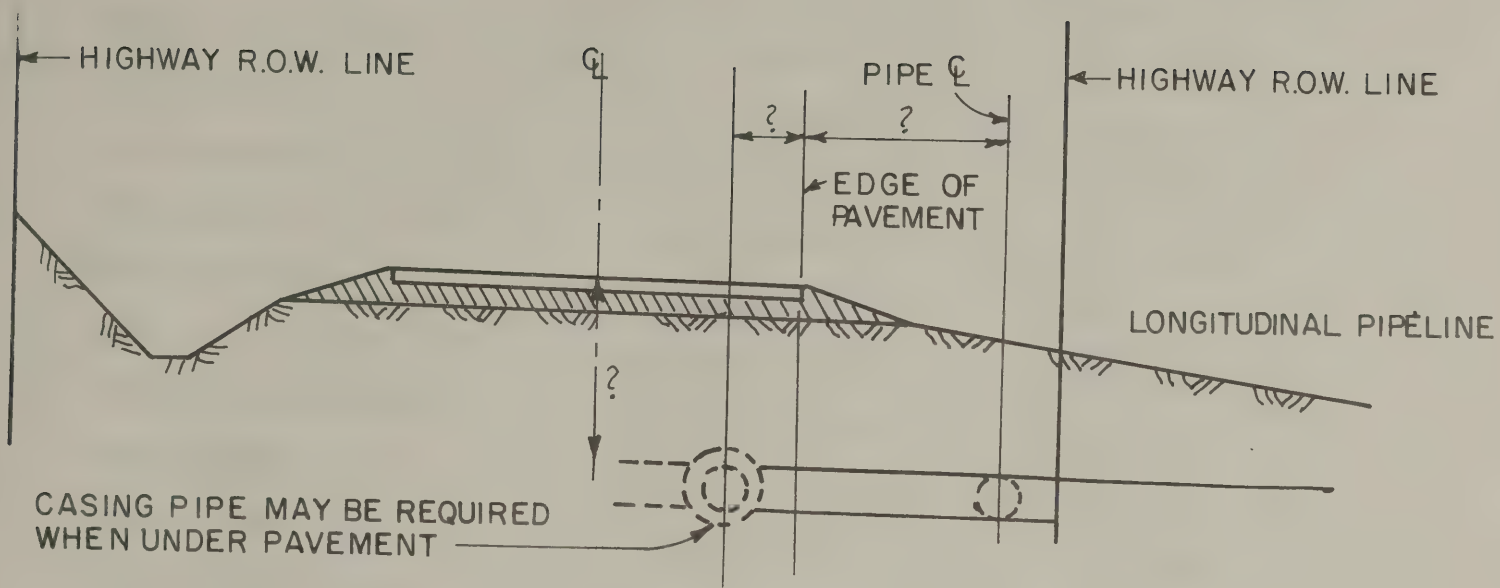
INFORMATION TO BE SHOWN ON PLAN SECTION



DWG. NO. 2

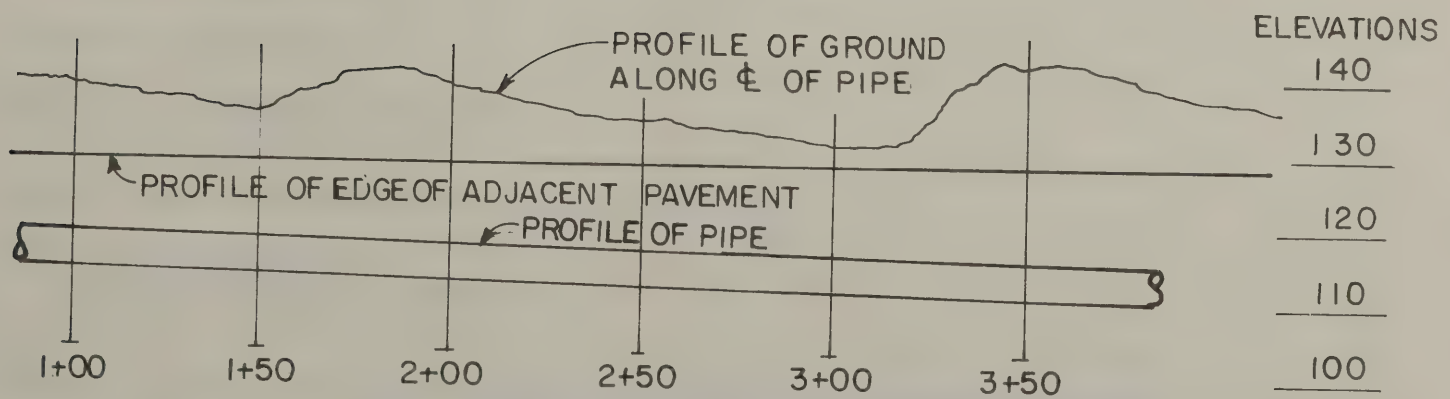


* 25' MIN. OR TO R.O.W. LINE WHICHEVER IS GREATER FOR CASING CARRYING FLAMMABLE SUBSTANCES.



SECTION

SCALE: HORIZ.
VERT.



PROFILE

SCALE: HORIZ.
VERT.

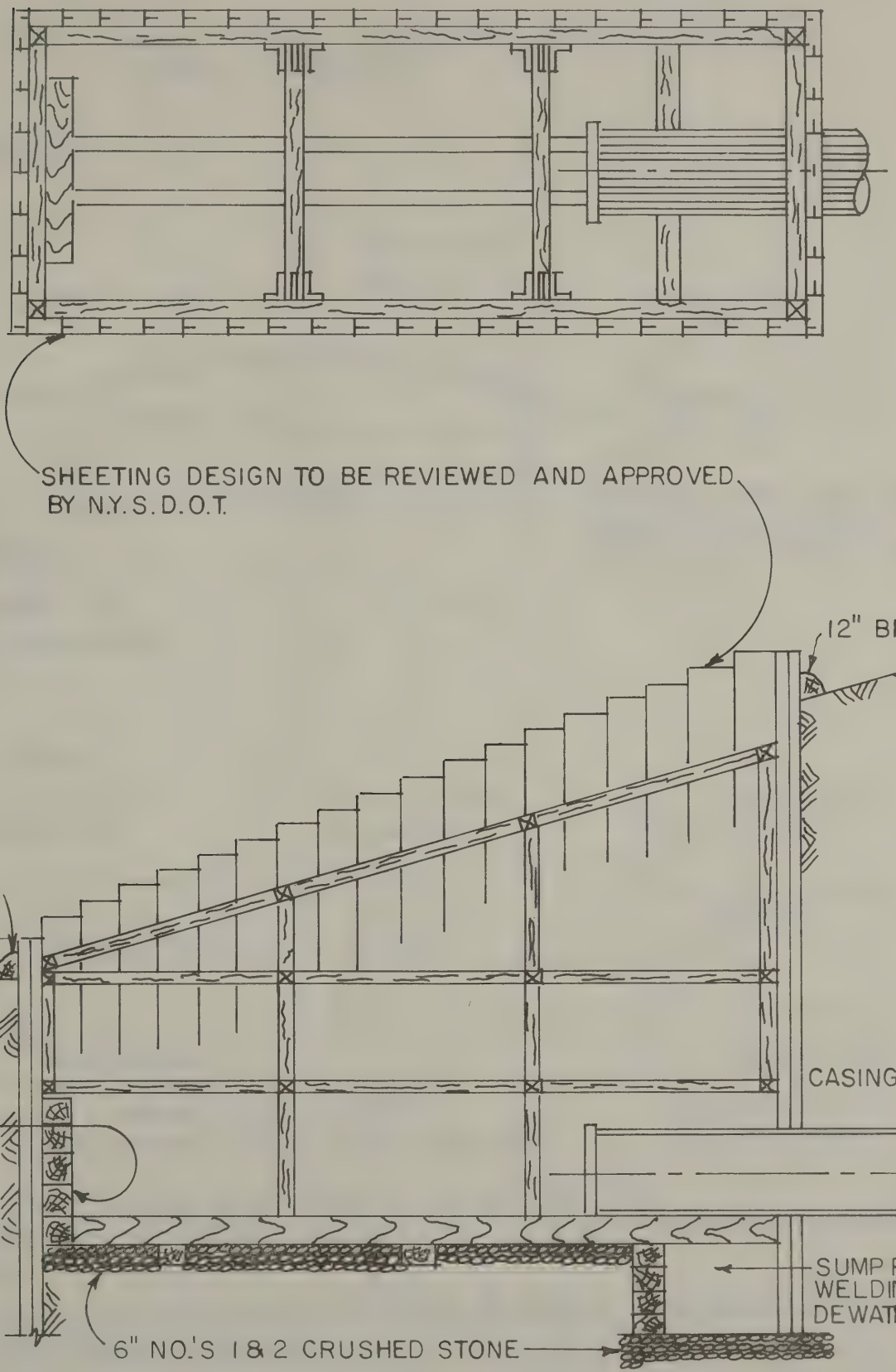
PIPE CROSSING - DATA SHEET

In addition to plan and profile of crossing, drawings submitted for N.Y.S. D.O.T. approval shall contain the following information:

	Pipe Data	
	Carrier Pipe	Casing Pipe
Contents To Be Handled.....		
Normal Operating Pressure.....		
Nominal Size of Pipe.....		
O. S. Diameter.....		
I. S. Diameter.....		
Wall Thickness.....		
Weight Per Foot.....		
Material.....		
Process of Manufacture.....		
Specification.....		
Grade or Class.....		
Test Pressure.....		
Type of Joint.....		
Type of Coating.....		
Details of Cathodic Protection...		
Details of Seal or Protection at Ends of Casing.....		
Method of Installation.....		
Character of Subsurface Material at the Crossing Location.....		
Approximate Ground Water Level...		
Source of Information on Subsurface Conditions Borings, Test Pits or Other).....		

NOTE: Any soil investigation made on state property or adjacent to pavements shall be carried on under the supervision of N.Y.S.D.O.T. Regional Traffic Engineer.

TYPICAL BORING PIT DETAILS DWG.NO.5



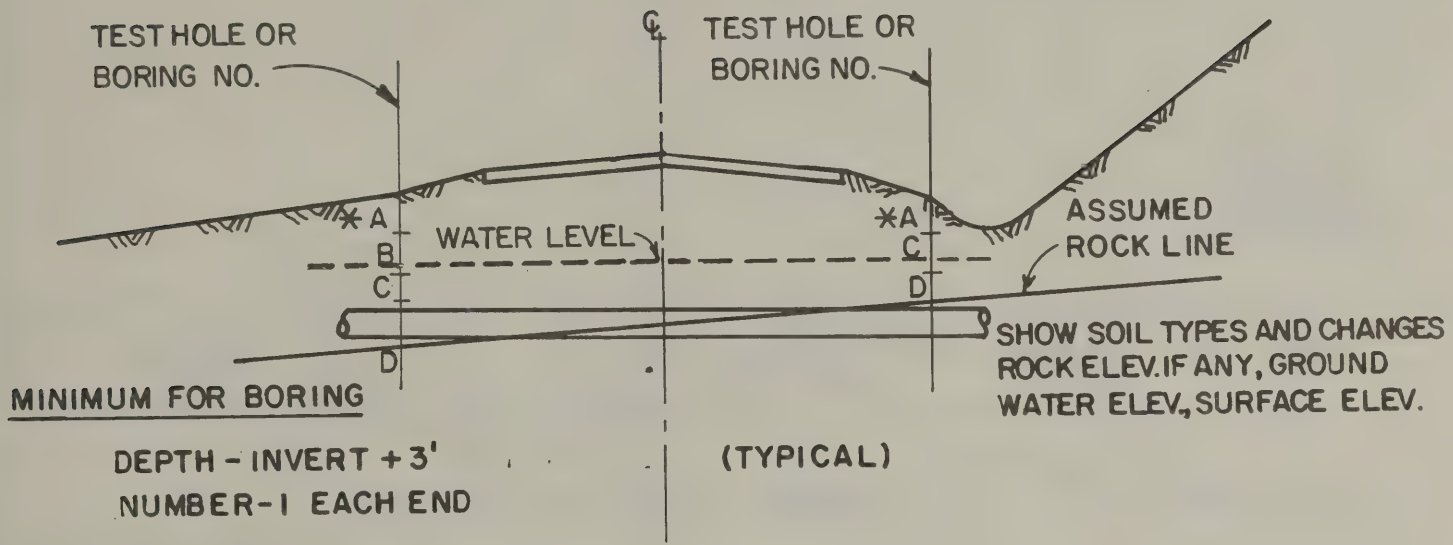
NOTE : 1. ALL DIMENSIONS AND MATERIAL SIZES MUST BE SHOWN.

2. 12" EARTH BERM TO BE PLACED AROUND SHEETING.

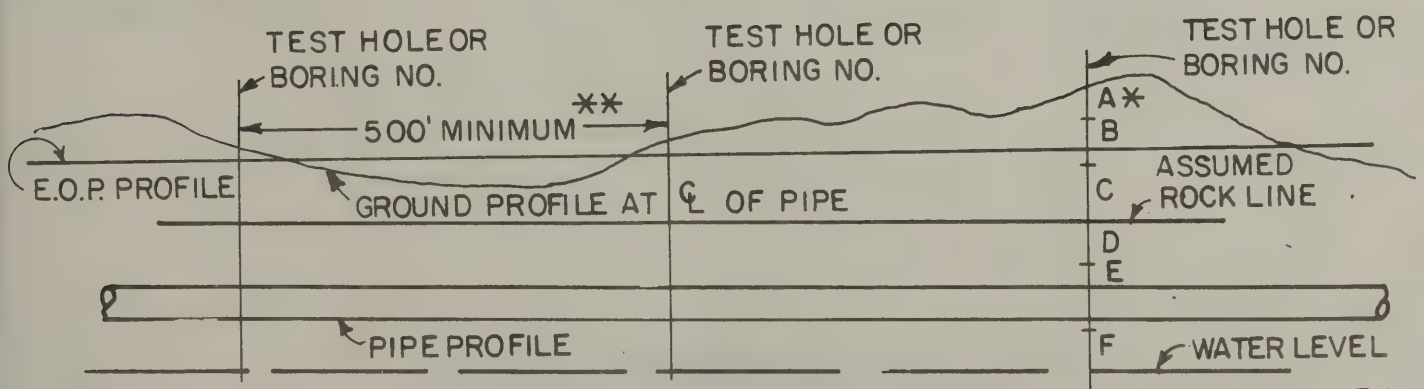
DWG. NO. 6

SOIL PROFILE

TRANSVERSE:

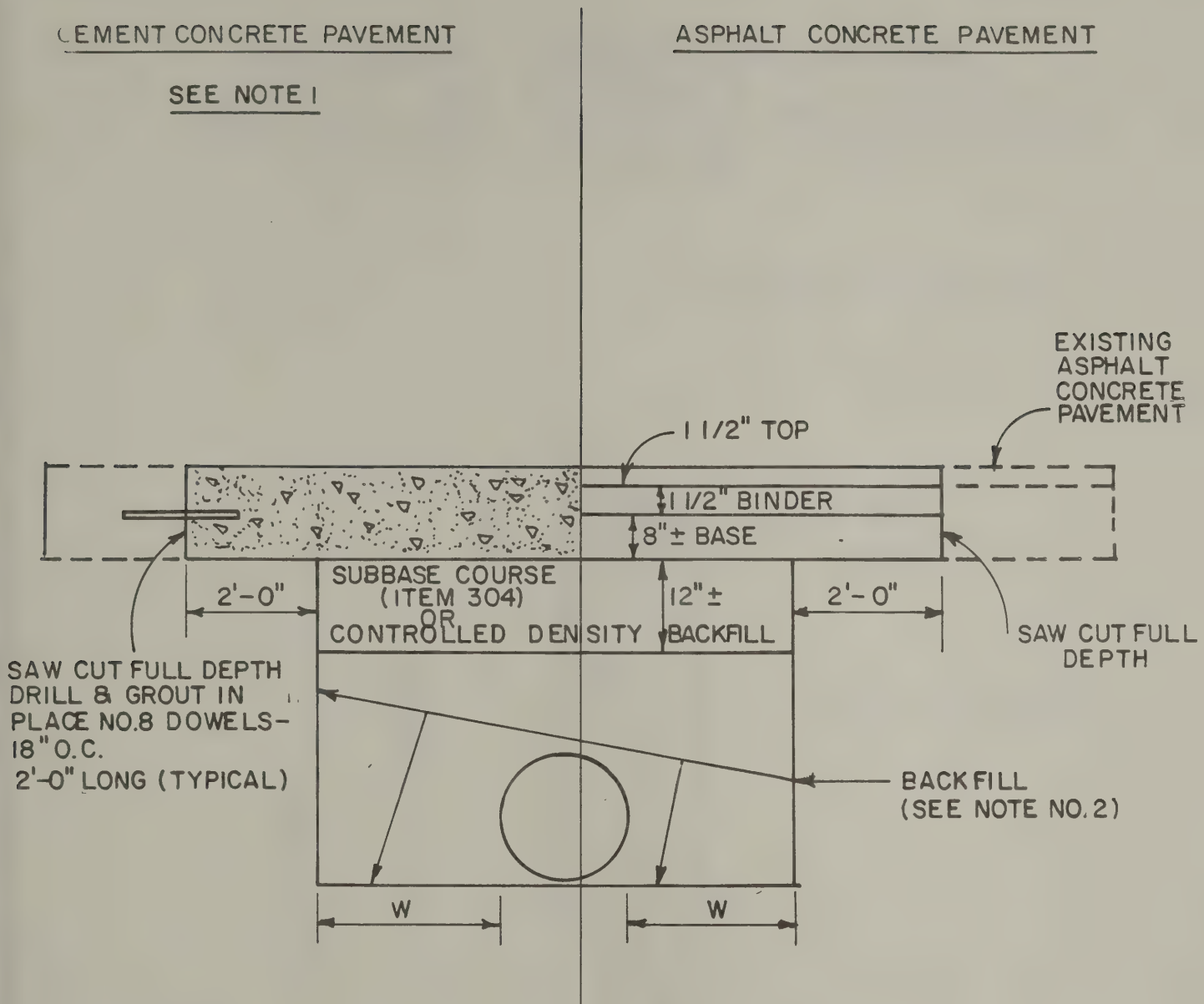


LONGITUDINAL:



* SOIL DESCRIPTIONS AS INDICATED BY A STANDARD SOIL CLASSIFICATION SYSTEM (i.e. U.S.D.A., F.A.A., A.A.S.H.T.O., N.Y.S. VISUAL, etc.) SHOWN ON BORING LOG.

** ADDITIONAL BORINGS MAY BE REQUIRED IF DEEMED NECESSARY BY THE REGIONAL TRAFFIC ENGINEER.



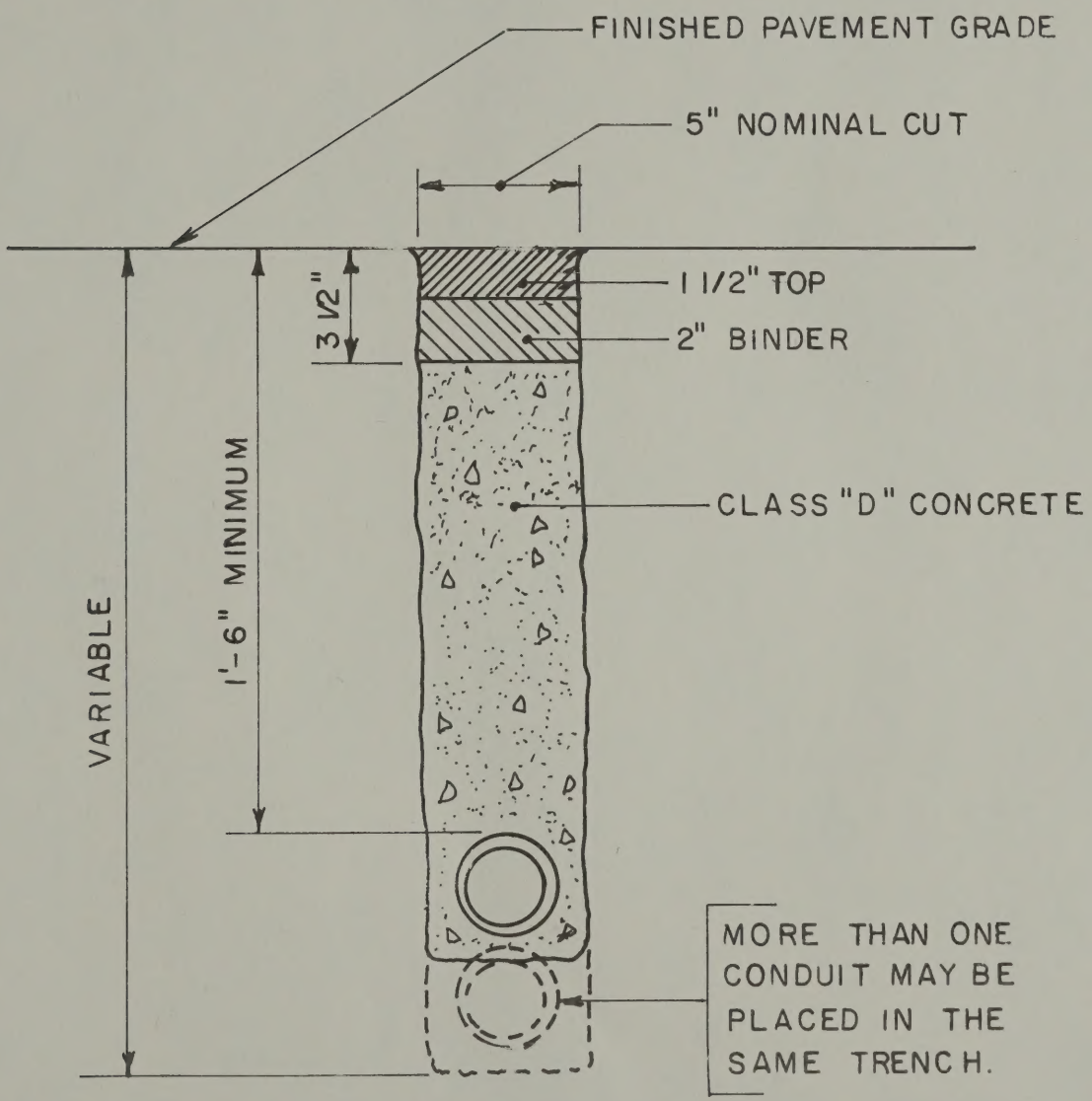
PAVEMENT REPLACEMENT DETAILS OF OPEN CUT CROSSING OF EXISTING PAVEMENT

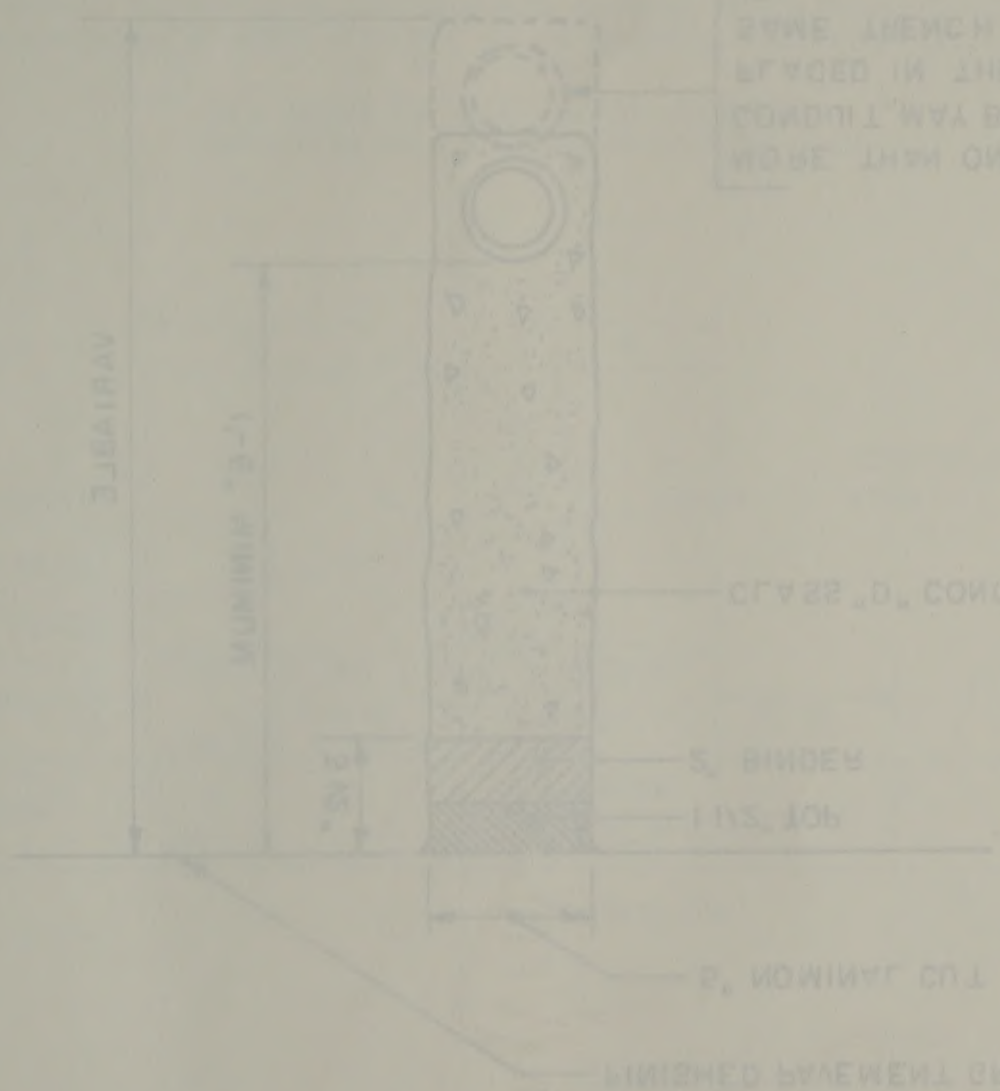
NOTE 1: WHEN CONCRETE IS USED, IT SHALL BE REINFORCED PORTLAND CEMENT CONCRETE WITH DOWELS INSTALLED AT THE REQUIRED SPACING. WHEN ASPHALT CONCRETE IS, IT SHALL CONSIST OF BASE, BINDER, AND TOP COURSES. THE TOTAL PAVEMENT THICKNESS SHALL MATCH EXISTING, UNLESS, OTHERWISE REQUIRED BY THE REGIONAL TRAFFIC ENGINEER.

NOTE 2: WHEN "W" IS LESS THAN 18", CONTROLLED DENSITY BACKFILL (K-KRETE OR EQUAL) SHALL BE USED. WHEN "W" IS 18" OR MORE, BACKFILL SHALL BE WITH SELECT GRANULAR MATERIAL FROM THE BOTTOM OF THE TRENCH TO THE BOTTOM OF THE SUBBASE COURSE. PLACEMENT SHALL BE AS DESCRIBED IN SECTIONS 200, EARTHWORK OF THE NEW YORK STATE DEPARTMENT OF TRANSPORTATION CURRENT SPECIFICATIONS AND ADDENDA.

ALTERNATE CONDUIT EXCAVATION, BACKFILL AND PAVEMENT REPLACEMENT

(USING ROTORY PAVEMENT CUTTER)





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